

WHAT IS CLAIMED IS:

5 *Drac 1*  
1. An isolated nucleic acid encoding a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2.

10 2. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes a polypeptide that specifically binds to polyclonal antibodies generated against SEQ ID NO:1 or SEQ ID NO:2.

15 3. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes SEQ ID NO:1 or SEQ ID NO:2.

20 4. The isolated nucleic acid sequence of claim 1, wherein the nucleic acid comprises a nucleotide sequence of SEQ ID NO:10 or SEQ ID NO:11.

25 5. The isolated nucleic acid of claim 1, wherein the nucleic acid is from a human, a mouse, or a rat.

30 6. The isolated nucleic acid of claim 1, wherein the nucleic acid is amplified by primers that selectively hybridize under stringent hybridization conditions to the same sequence as degenerate primer sets encoding amino acid sequences selected from the group consisting of:

GQPSFTSLLN (SEQ ID NO:19) and

PRLSESPQDG (SEQ ID NO:20).

35 7. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes a polypeptide having a molecular weight of about between 40 kDa to about 50 kDa.

8. An isolated nucleic acid encoding a sensory cell specific polypeptide that specifically hybridizes under highly stringent conditions to a nucleic acid having the sequence of SEQ ID NO:10 or SEQ ID NO:11.

5 9. An isolated nucleic acid encoding a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2, wherein said nucleic acid selectively hybridizes under moderately stringent hybridization conditions to a nucleotide sequence of SEQ ID NO:10 or SEQ ID NO:11.

10 10. An isolated sensory cell specific polypeptide, the polypeptide having greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2.

15 11. The isolated polypeptide of claim 10, wherein the polypeptide specifically binds to polyclonal antibodies generated against SEQ ID NO:1 or SEQ ID NO:2.

20 12. The isolated polypeptide of claim 10, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2.

25 13. The isolated polypeptide of claim 10, wherein the polypeptide is from a human, a rat, or a mouse.

14. An antibody that selectively binds to the polypeptide of claim 10.

15. An expression vector comprising the nucleic acid of claim 1.

16. A host cell transfected with the vector of claim 15.

30 17. A method for identifying a compound that modulates sensory signaling in sensory cells, the method comprising the steps of:

(i) contacting the compound with a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2; and

5 (ii) determining the functional effect of the compound upon the sensory cell specific polypeptide.

18. The method of claim 17, wherein the polypeptide specifically binds to polyclonal antibodies generated against SEQ ID NO:1 or SEQ ID NO:2.

10 19. The method of claim 17, wherein the functional effect is determined by measuring changes in intracellular cAMP, IP3, or  $\text{Ca}^{2+}$ .

20. The method of claim 17, wherein the functional effect is a chemical effect.

15 21. The method of claim 17, wherein the functional effect is a physical effect.

22. The method of claim 17, wherein the polypeptide is recombinant.

20 23. The method of claim 17, wherein the polypeptide is from a human, a mouse, or a rat.

25 24. The method of claim 17, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2.

25 25. The method of claim 17, wherein the polypeptide is expressed in a cell or cell membrane.

30 26. The method of claim 25, wherein the cell is a eukaryotic cell.

27. The method of claim 17, wherein the polypeptide is linked to a solid phase.

28. The method of claim 27, wherein the polypeptide is covalently linked to a solid phase.

29. A method of making a sensory cell specific polypeptide, the method comprising the step of expressing the polypeptide from a recombinant expression vector comprising a nucleic acid encoding the polypeptide, wherein the amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2.

30. A method of making a recombinant cell comprising a sensory cell specific polypeptide, the method comprising the step of transducing the cell with an expression vector comprising a nucleic acid encoding the polypeptide, wherein the amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2.

31. A method of making an recombinant expression vector comprising a nucleic acid encoding a sensory cell specific polypeptide, the method comprising the step of ligating to an expression vector a nucleic acid encoding the polypeptide, wherein the amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:1 or SEQ ID NO:2.

32. An isolated nucleic acid encoding a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

33. The isolated nucleic acid of claim 32, wherein the nucleic acid encodes a polypeptide that specifically binds to polyclonal antibodies generated against SEQ ID NO:3 or SEQ ID NO:4.

34. The isolated nucleic acid of claim 32, wherein the nucleic acid encodes SEQ ID NO:3 or SEQ ID NO:4.

5 35. The isolated nucleic acid sequence of claim 32, wherein the nucleic acid comprises a nucleotide sequence of SEQ ID NO:12 or SEQ ID NO:13.

36. The isolated nucleic acid of claim 32, wherein the nucleic acid is from a human, a mouse, or a rat.

10 37. The isolated nucleic acid of claim 32, wherein the nucleic acid is amplified by primers that selectively hybridize under stringent hybridization conditions to the same sequence as degenerate primer sets encoding amino acid sequences selected from the group consisting of:

15 STEGAGGQES (SEQ ID NO:21) and  
WMPNILKATE (SEQ ID NO:22).

20 38. The isolated nucleic acid of claim 32, wherein the nucleic acid encodes a polypeptide having a molecular weight of about between 80 kDa to about 90 kDa.

25 *Sub-B* 39. An isolated nucleic acid encoding a sensory cell specific polypeptide that specifically hybridizes under highly stringent conditions to a nucleic acid having the sequence of SEQ ID NO:12 or SEQ ID NO:13.

30 40. An isolated nucleic acid encoding a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4, wherein said nucleic acid selectively hybridizes under moderately stringent hybridization conditions to a nucleotide sequence of SEQ ID NO:12 or SEQ ID NO:13.

41. An isolated sensory cell specific polypeptide, the polypeptide having greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

5 42. The isolated polypeptide of claim 41, wherein the polypeptide specifically binds to polyclonal antibodies generated against SEQ ID NO:3 or SEQ ID NO:4.

10 43. The isolated polypeptide of claim 41, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

44. The isolated polypeptide of claim 41, wherein the polypeptide is from a human, a rat, or a mouse.

15 45. An antibody that selectively binds to the polypeptide of claim 41.

46. An expression vector comprising the nucleic acid of claim 32.

20 47. A host cell transfected with the vector of claim 46.

48. A method for identifying a compound that modulates sensory signaling in sensory cells, the method comprising the steps of:

25 (i) contacting the compound with a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4; and

(ii) determining the functional effect of the compound upon the sensory cell specific polypeptide.

30 49. The method of claim 48, wherein the polypeptide specifically binds to polyclonal antibodies generated against SEQ ID NO:3 or SEQ ID NO:4.

50. The method of claim 48, wherein the functional effect is determined by measuring changes in intracellular cAMP, IP3, or  $\text{Ca}^{2+}$ .

5 51. The method of claim 48, wherein the functional effect is a chemical effect.

52. The method of claim 48, wherein the functional effect is a physical effect.

10 53. The method of claim 48, wherein the polypeptide is recombinant.

54. The method of claim 48, wherein the polypeptide is from a human, a mouse, or a rat.

15 55. The method of claim 48, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

56. The method of claim 48, wherein the polypeptide is expressed in a cell or cell membrane.

20 57. The method of claim 56, wherein the cell is a eukaryotic cell.

58. The method of claim 48, wherein the polypeptide is linked to a solid phase.

25 59. The method of claim 58, wherein the polypeptide is covalently linked to a solid phase.

30 60. A method of making a sensory cell specific polypeptide, the method comprising the step of expressing the polypeptide from a recombinant expression vector comprising a nucleic acid encoding the polypeptide, wherein the

amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

5 61. A method of making a recombinant cell comprising a sensory cell specific polypeptide, the method comprising the step of transducing the cell with an expression vector comprising a nucleic acid encoding the polypeptide, wherein the amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

10 62. A method of making an recombinant expression vector comprising a nucleic acid encoding a sensory cell specific polypeptide, the method comprising the step of ligating to an expression vector a nucleic acid encoding the polypeptide, wherein the amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

15 63. An isolated nucleic acid encoding a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:5 or SEQ ID NO:6.

20 64. The isolated nucleic acid of claim 63, wherein the nucleic acid encodes a polypeptide that specifically binds to polyclonal antibodies generated against SEQ ID NO:5 or SEQ ID NO:6.

25 65. The isolated nucleic acid of claim 63, wherein the nucleic acid encodes SEQ ID NO:5 or SEQ ID NO:6.

30 66. The isolated nucleic acid sequence of claim 63, wherein the nucleic acid comprises a nucleotide sequence of SEQ ID NO:14 or SEQ ID NO:15.

67. The isolated nucleic acid of claim 63, wherein the nucleic acid is from a human, a mouse, or a rat.



68. The isolated nucleic acid of claim 63, wherein the nucleic acid is amplified by primers that selectively hybridize under stringent hybridization conditions to the same sequence as degenerate primer sets encoding amino acid sequences selected from the group consisting of:

NCPCLERYNA (SEQ ID NO:23) and  
IRYMCSSVLQ (SEQ ID NO:24).

69. The isolated nucleic acid of claim 63, wherein the nucleic acid encodes a polypeptide having a molecular weight of about between 35 kDa to about 45 kDa.

70. An isolated nucleic acid encoding a sensory cell specific polypeptide that specifically hybridizes under highly stringent conditions to a nucleic acid having the sequence of SEQ ID NO:14 or SEQ ID NO:15.

71. An isolated nucleic acid encoding a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of <sup>SEQ ID NO: 5 or SEQ ID NO: 6</sup> SEQ ID NO:5 or SEQ ID NO:5, wherein said nucleic acid selectively hybridizes under moderately stringent hybridization conditions to a nucleotide sequence of SEQ ID NO:14 or SEQ ID NO:15.

72. An isolated sensory cell specific polypeptide, the polypeptide having greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:5 or SEQ ID NO:6.

73. The isolated polypeptide of claim 72, wherein the polypeptide specifically binds to polyclonal antibodies generated against SEQ ID NO:5 or SEQ ID NO:6.

74. The isolated polypeptide of claim 72, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:5 or SEQ ID NO:6.

75. The isolated polypeptide of claim 72, wherein the polypeptide is from a human, a rat, or a mouse.

5 76. An antibody that selectively binds to the polypeptide of claim 72.

77. An expression vector comprising the nucleic acid of claim 63.

78. A host cell transfected with the vector of claim 77.

10

79. A method for identifying a compound that modulates sensory signaling in sensory cells, the method comprising the steps of:

(i) contacting the compound with a sensory cell specific polypeptide, the polypeptide comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:5 or SEQ ID NO:6; and

15

(ii) determining the functional effect of the compound upon the sensory cell specific polypeptide.

20

80. The method of claim 79, wherein the polypeptide specifically binds to polyclonal antibodies generated against SEQ ID NO:5 or SEQ ID NO:6.

81. The method of claim 79, wherein the functional effect is determined by measuring changes in intracellular cAMP, IP3, or  $Ca^{2+}$ .

25

82. The method of claim 79, wherein the functional effect is a chemical effect.

83. The method of claim 79, wherein the functional effect is a physical effect.

30

84. The method of claim 79, wherein the polypeptide is recombinant.

85. The method of claim 79, wherein the polypeptide is from a human, a mouse, or a rat.

86. The method of claim 79, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:5 or SEQ ID NO:6.

87. The method of claim 79, wherein the polypeptide is expressed in a cell or cell membrane.

88. The method of claim 87, wherein the cell is a eukaryotic cell.

89. The method of claim 79, wherein the polypeptide is linked to a solid phase.

90. The method of claim 89, wherein the polypeptide is covalently linked to a solid phase.

91. A method of making a sensory cell specific polypeptide, the method comprising the step of expressing the polypeptide from a recombinant expression vector comprising a nucleic acid encoding the polypeptide, wherein the amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:5 or SEQ ID NO:6.

92. A method of making a recombinant cell comprising a sensory cell specific polypeptide, the method comprising the step of transducing the cell with an expression vector comprising a nucleic acid encoding the polypeptide, wherein the amino acid sequence of the polypeptide comprises greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:5 or SEQ ID NO:6.

93. A method of making an recombinant expression vector comprising a nucleic acid encoding a sensory cell specific polypeptide, the method comprising the step of ligating to an expression vector a nucleic acid encoding the

ce of the polypeptide comprises gr  
acid sequence of SEQ ID NO:5 on

~~add p 2~~

[illegible]